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Journal article

### Developing new opportunities, entrepreneurial skills and product/service creativity: A ‘Young Enterprise’ (YE) perspective Fearon, C., van Vuuren, W., M. Furlotti and McLaughlin, H.

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# **Developing new opportunities, entrepreneurial skills and product/service creativity: A ‘*Young Enterprise*’ (YE) perspective**

## **Abstract**

The purpose of this research is to investigate how Young Enterprise (YE) student entrepreneurs develop new product/service opportunities, learn decision-making skills and achieve a sense of entrepreneurial self-efficacy. From a national survey of YE participants in the Netherlands, entrepreneurial self-efficacy was found to partially mediate relationships between new opportunity recognition belief and two key product/service creativity characteristics, namely: (a) new product/service novelty and; (b) new product/service meaningfulness. The ability of YE entrepreneurs to re-scale their new venture strategies, and/or re-adapt products and services were also important *real options* (or strategic decision-making) moderators in a new social cognitive learning framework. This article contributes to a fresh understanding of the opportunity recognition belief and entrepreneurial decision skills literatures from a social cognitive theoretical perspective. This research also provides much needed empirical support for European YE policy-makers, demonstrating that team-based mini-enterprise education initiatives really do benefit entrepreneurial learners!

**Keywords:** Young Enterprise (YE), opportunity recognition belief, entrepreneurial self-efficacy, social cognitive theory, real options

## **INTRODUCTION**

Mini-enterprise programmes have become increasingly popular, with many examples of young people and students setting up new business ventures and companies, under the auspices of Young Enterprise (YE). The Young Enterprise (JA Europe) organization, for example, is a world leader in this area, working with new venture entrepreneurs in over 35 countries. As such, Young Enterprise student company programmes represent a major research opportunity for businesses,

foundations, educational institutions and governments to better understand how young people innovate, learn new decision-making skills, and develop a stronger sense of entrepreneurial self-efficacy. To date, there has been a surprisingly limited amount of quantitative scholarly research that investigates how new product/service opportunities are developed and evaluated within action-based learning programmes, such as YE. This article attempts to address this (quantitative) research gap, by investigating the experiences of entrepreneurship students on one such leading YE European initiative - *Jong Ondernemen* - in the Netherlands (see further details under the 'Procedure' section).

Given the relatively limited amount of quantitative European YE research to date (e.g. Athayde 2009; Johansen 2010; Riese 2011, 2013; Quesel, Moeser, and Burren 2017), the central research question (RQ) asks: *how can YE students (as nascent entrepreneurs<sup>1</sup>) shape and evaluate their new product/service opportunities, improve decision-making skills, and develop a sense of entrepreneurial self-efficacy*. As enterprise education researchers, our primary motivation has been to develop a robust and seminal quantitative study that investigates the impact of nascent entrepreneurial opportunity development and decision-making skills for European YE policy makers.

We know that entrepreneurial learners often try to envision their new products/service opportunities in line with target markets and the fulfillment of potential customer needs (Honig and Hopp 2019). In fact, young entrepreneurs can spend a lot of time trying to develop potentially creative and innovative product/service options in this way. However, despite best efforts, not all prospective product/service opportunities generated are particularly novel, or meaningful from a market-oriented perspective. This article argues it is mainly when new product/service opportunity beliefs are considered in a marketplace context, that YE student entrepreneurs can actively learn to verify, or reject their initial assumptions (Dimov 2010). The internal confirmation/disconfirmation process is based on addressing fundamental market-oriented questions (as a YE student team), such as: *how unique and novel are our new*

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<sup>1</sup> 'Nascent' in this context simply refers to YE entrepreneurs who are in the process of starting-up their new ventures; i.e. with a clear focus on developing new product/service opportunities in target markets for the purposes of business planning and growth.

*opportunity ideas in the proposed marketplace? and; how relevant or meaningful are our new product/service ideas in addressing customer needs and expectations?*

Grégoire, Barr, and Shepherd (2010a, p.415) define opportunity recognition beliefs (ORB's) as: "*the formation of subjective beliefs that a [business solution] opportunity exists for those with the relevant abilities and means to exploit*". In this study, ORB(s) are investigated within a (post-secondary) student team-based *social cognitive* theoretical framework (Bandura 1995, 2001; Fiske and Taylor 1991), thus contributing to, and extending the work of recent opportunity recognition scholars (e.g. Gregoire *et al.* 2010; McMullen and Shepherd 2006). To date, ORB researchers have mostly been interested in how individual entrepreneurs internally regulate and mentally process their new opportunity beliefs (i.e. internal cognition).

The current article takes these ideas a step further by including elements of YE team-based social cognition. In this way, our new product/service development framework can model market-oriented and social decision-making influences on YE student teams during the start-up process. For example, this article tests if ORB(s) positively relate to perceptions of product/service creativity and market-oriented indicators, such as new product/service novelty and product/ service meaningfulness (as outlined in the previous paragraph). This research also investigates if the combined indirect effects of ORB and entrepreneurial self-efficacy are statistically significant within a YE context. In addition, the current research examines if learning *enactive mastery* skills (Bandura 2001, 2012), in the form of *real options* decision strategies, such as: (a) *scaling a new venture up/or down, or; (b) adapting new products and services* are significant in the overall product/service opportunity development process. Finally, this article suggests that YE student entrepreneurs would benefit from learning how to balance *being entrepreneurial* with a *sense of market orientation* when developing their new product/service ideas (Frishammar and Åke Hörte 2007; Miles and Arnold 1991).

## **Background to opportunity recognition beliefs (ORB(s))**

Before making the case for a social cognitive theoretical contribution (see next sub-section), it is useful to revisit some of the core ontological assumptions of recent ORB research within a YE

action-learning context. Kitching and Rouse (2017) usefully disentangle the concept of the opportunity circumstances from agential beliefs, and it is the latter aspect that interests us. Firstly, there is a growing debate about the *subjective versus objective* qualities of the opportunity recognition process (Grégoire *et al.* 2010a; Grégoire, Corbett, and McMullen, 2010b; Shepherd, McMullen, and Jennings 2007). It is often not the objective merits of a new product/service idea that are considered most important for new venture entrepreneurs, rather the subjective belief that an opportunity *possibly* exists, or may be exploitable at a future point in time. Of course, when facing uncertainty, young novice entrepreneurs are often expected to react positively to opportunities for action; overcoming self-doubts, hesitation and any natural tendency to procrastinate, lest new and exciting business opportunities are missed (Cope 2011; McMullen, and Shepherd 2006; Shane and Venkataraman 2000). After all, asymmetry of subjective beliefs about the value of new products and service markets is a key feature of developing new ORB(s); so that not everyone, except those daring enough, will be able to recognize or exploit their creative (market) potential (Kirzner 1973; Shane and Venkataraman 2000). However, unfounded optimism and hubris can quickly lead to product/service failure, and so there are real dangers for novice entrepreneurs who ignore market-oriented risks in favor of more intuitive and *gung-ho* approaches to opportunity development (e.g. Hayward, Shepherd, and Griffin 2006).

Secondly, there is often no real firm product or market-place data (e.g. historical financials) to offer a reliable steer, certainly during the early stages of innovative product/service idea development. ORB scholars suggest that evaluating risk/return tradeoffs in this scenario can be a highly subjective and internal process; *viz*, it is ultimately the motivation and self-belief of the individual entrepreneur(s) that counteracts uncertainty, thereby leading to a decision to enact, or discard initial opportunity ideas (McMullen and Shepherd 2006). This type of subjective decision-making can also be risky for novice entrepreneurial teams, especially, if some team-member voices are louder than others. ORB subjectivity is undoubtedly influenced by common group decision-making biases (e.g. group-think, tendency to action, and so on), as well as individual actor limits to decision rationality and cognitive information processing capabilities (Grégoire *et al.* 2011).

By proposing a new social cognitive learning framework, the current research alleviates some of the above heuristic problems. YE student entrepreneurs often benefit from systematically being encouraged to *stop and reflect* with their team colleagues, thus avoiding the dangers of hubris and group-think. In other words, YE students as active entrepreneurial learners are encouraged to *stop, reflect and align*, (or re-align if necessary) their new product/service ORB(s) with the creativity and innovation expectations of intended target markets.

## **THEORY DEVELOPMENT**

### **A social cognitive theory (SCT) contribution**

A social cognitive theoretical perspective assumes that YE team members<sup>2</sup> are all '*motivated tacticians*' and fully engaged thinkers, who are attempting to satisfy their '*goals, motives and needs*' within a complex new venture environment (Fiske and Taylor 1991, p.13). In terms of a scholarly critique, please understand, our research doesn't dismiss the idea of internal (cognitive) self-regulation of opportunity beliefs (McMullen and Shepherd 2006; Shepherd *et al.* 2007; Grégoire *et al.* 2010a, 2010b, 2011). On the contrary, this article contributes to the above ORB literature discourse, by arguing that both *internal* and *social* forms of cognitive reasoning are required by novice entrepreneurs when learning about new product/service opportunity development within a team-based setting (such as YE).

In terms of a specific theoretical contribution, applying a social cognitive approach moves the learning focus of self-regulatory research (Tumasjan and Braun 2012) away from the individual entrepreneur and his/ or her internally self-oriented decision heuristics and person-centric capabilities. Developing team-based social cognitive capabilities help to overcome major environmental and social barriers, and arguably a *lack of can do*, sometimes associated with novice single-founder start-ups, including a limited access to human and financial resources. Social cognitive capabilities involve the learner's ability to self-reflect upon one's own actions

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<sup>2</sup> The unit of analysis is at an individual level. In other words, each team member was surveyed as an individual YE participant/student within their organization. Therefore, at times we may refer to YE '*team members*' and '*individuals*' interchangeably.

and circumstances, as well as *reaching out* to others, and then to make relevant and considered business changes where necessary, often as part of a team-oriented process (Macrae and Bodenhausen 2001; Mitchell, Busenitz, Bird, Gaglio, and McMullen 2007).

Therefore, in the next subsection, it is argued that social cognitive theory is particularly useful for understanding how team-based YE product/service opportunity beliefs (ORB's) are first formed, and subsequently evaluated against the creativity and innovation expectations of intended target markets. Social cognitive theory is also important, as we are able to model (combined) ORB and entrepreneurial self-efficacy relationships in conjunction with YE learner decision-making skills, which are discussed later in the article (Bandura 2012).

### Matching ORBs and product/service creativity – *social cognitive learning in action*

According to social cognitive theory, once opportunity beliefs (ORBs) are first formed, YE team participants should be able to discuss, reflect and double-check if they are *product/service (p/s) creative*, and thus market-viable. For example, Dimov (2007) suggests that innovative opportunity development frequently involves individuals, or small groups working and actively learning together in highly socialized teams to creatively shape, discuss and interpret novel product/service ideas; whereby, some are elaborated upon and refined, whilst others are altered, or discarded - *but how [using social cognitive theory] might this reflective learning process work for novice (YE) teams?* Our article theorizes that truly innovative opportunities can partly be identified by modelling new venture product/service creativity variables as *market-oriented outcomes*, which can then be formally checked, or structurally aligned against initial ORB(s). If these structurally aligned relationships<sup>3</sup> are positive, then arguably, there is an internal social belief system (i.e. within the YE student team) that fledgling product/service opportunity ideas are indeed novel, innovative and meaningful to potential customers in intended target market(s). If posited relationships are not positive, then YE team participants either don't believe in their

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<sup>3</sup> Higher order 'structurally aligned' causal relationships (Grégoire *et al.* 2010, p.416) are hypothesized based upon Grégoire *et al.*'s 'proposition 1', i.e. YE individuals compare and utilize new signals or information from their environment to help make sense of early opportunity recognition as part of meaningful comparative/pattern analysis.



new business solution ORB(s), and/or some aspect of the proposed product/service idea. Regardless, these associative relationships become a useful *check marker* for all YE student team-members to reflect upon, and actively discuss their concerns.

Drawing upon the work of creativity scholars (e.g. Amabile, Conti, Coon, Lazenby, and Herron 1996; Im and Workman 2004), Hong, Song and Yoo (2013, p.46) succinctly defined product/service idea creativity as: “*the degree to which products are perceived to have unique differences from competitor’s products in ways that are meaningful to target customers*”. Two specific product/service creativity (dependent) variables are considered in the social cognitive model, namely: (1) *new product/service novelty (NPSN)*, which measures new product and service ideas against perceived differences from industry norms, and; (2) and *new product/service meaningfulness (NPSM)*, which measures the extent products and service ideas are deemed useful and appropriate for the needs of intended customers.

As subjective *tests of the market*, it is suggested that both creativity variables (i.e. NPSN and NPSM) can help us better understand the market orientation of newly constructed ORB(s) (Frishammar and Åke Hörte, 2007). In summary, this article empirically models (see Figure 1) an unfolding product/service opportunity development process (Dimov 2007, 2010), thus enabling early stage perceptual evaluations and team reflections against initial ORB(s). Novelty and meaningfulness also have the advantage of being conceptually distinct from ORB formation (Grégoire *et al.* 2010b). Therefore, they remain particularly useful as subjective *check and balance* markers, especially during the early stages of YE team-based product/service opportunity development.

With these ideas in mind, the research firstly investigates if ORB(s) are directly related to both product/service creativity variables. Hypotheses pertaining to direct effects are modelled below (H1-H2):

***H1. Opportunity recognition belief is positively related to new product/service novelty.***

***H2. Opportunity recognition belief is positively related to new product/service meaningfulness.***

In the following subsections, the combined/ indirect effects of ORB and entrepreneurial self-efficacy are theorized as the core underpinning of a new product/service (p/s) opportunity development model, i.e. from a social cognitive and entrepreneurial skills development perspective (see Figure 1).

### **Self-efficacy versus entrepreneurial self-efficacy – a social cognitive underpinning**

Bandura (1995, p.2) suggests that self-efficacy (underpinned by social cognitive theory): “*refers to beliefs in one's capabilities to organize and execute the courses of action required to manage prospective situations*”. It can refer (for example) to a YE participant’s belief or judgment about their own ability to carry out a range of work tasks within different contexts, or how they operate within team setting.

From a motivational perspective, learners with higher levels of self-efficacy are more likely to persist and be successful with task accomplishment, as well as become more resilient in the face of adversity (Bandura, 2012). Entrepreneurial self-efficacy (ESE), as a domain specific derivation of general self-efficacy, can be succinctly considered as: “*a construct that measures a person’s belief in their ability to successfully launch an entrepreneurial venture*” (McGee, Peterson, Mueller, and Sequeira 2009, p.965). Entrepreneurial self-efficacy may also refer to novice YE team-member(s) beliefs in their capability to organize and execute key product/service opportunity development tasks, including for example: new venture planning; marketing; innovation; risk-taking etc. It is thus, a useful construct for investigating how participants self-report their own efforts within a (YE) mini-enterprise context (Chen, Greene, and Crick 1998; BarNir, Watson, and Hutchins 2011). With the above in mind, the next subsection theorizes how product/service ORB(s) and entrepreneurial self-efficacy might relate to each other within the confines of new a p/s opportunity development model (see Figure 1).

## ORB(s) and entrepreneurial self-efficacy in a YE setting

From social cognitive theory, we know that entrepreneurial self-efficacy develops through a process of engagement and social learning (Bacq, Ofstein, Kickul, and Gundry 2017; Bandura 2001, 2012). Within the new product/service opportunity development model (see Figure 1), this article suggests that entrepreneurial self-efficacy develops for student entrepreneurs as a consequence of ORB formation, in action oriented learning environments (such as YE).

Grégoire *et al.* (2010b) suggest two core elements of ORB formation: the first is a tentative alignment of a new product/service idea with the market in mind; the second assesses the general feasibility of the new opportunity and its strength/ maturity, for application among individuals, or firms in the target market. The authors (*ibid*) also discussed a third element: namely, the general desirability of a new product/service opportunity; but propose further research, as they were not convinced it was an intrinsic dimension of ORB. Grégoire *et al.* (2010b, 2011) suggested further processual ORB research and conceptualizations, which is why *creativity evaluations* are included in the new p/s opportunity development model (see next subsection for further discussion).

For now, it is important to remember (let us assume) that YE entrepreneurs have no substantial prior business experience, and therefore, no legitimate claim to entrepreneurial self-efficacy. They may indeed be self-confident young individuals, and even feel self-assured of their own personal capabilities. They may have relatives who are entrepreneurs, or been influenced by prior work learning, and/or previous work placement experiences (Zhao, Seibert, and Hills 2005). However, they cannot legitimately claim nascent entrepreneurial self-efficacy, until at the very least, they properly consider their new initial product/service ORB(s), as part of the YE team-based self-regulatory process (Gregoire *et al.* 2010b). Only after YE ORB(s) are first formed, can they then be reflected upon and evaluated against the innovativeness and creativity expectations of customers in target markets.

For these reasons, it is argued that entrepreneurial self-efficacy must be modelled at the very heart of this *social cognitive learning process*, i.e. a consequence of initial ORB formation,

as opposed to an antecedent in a YE cross-sectional research design.<sup>4</sup> From a social cognitive theoretical perspective, a mediating role for entrepreneurial self-efficacy in the new opportunity development model (see Figure 1) is central to the reflexive idea that subjective ORB(s) are linked with an individual's ability to learn new decision-making skills and evaluative capabilities. These skills/capabilities are required in order to become a more effective entrepreneur (discussed further in the next '*moderated-mediation effects*' subsection).

There is some existing evidence to suggest that entrepreneurial self-efficacy (ESE) is important for product/service opportunity development success. For example, ESE has been shown to affect the quality of investment decisions, as well as creating a successful operating business (Cassar and Friedman 2009). Furthermore, high ESE has been associated with more formal and comprehensive business planning approaches; namely, among those entrepreneurs who are generally considered better prepared (Brinckmann and Kim 2015). Finally, McGee *et al.* (2009, p.984) suggest that entrepreneurial self-efficacy contributes to confidence building after "*identifying a new product or service idea*", along with the development of new venture planning skills, such as, managing resources, people and finance.

With the above in mind, two baseline mediation hypotheses (H3-H4) are constructed to investigate the indirect effects of ORB(s) and entrepreneurial self-efficacy on both product/service creativity outcomes:

***H3. Entrepreneurial self-efficacy mediates the relationship between opportunity recognition belief and new product/service novelty.***

***H4. Entrepreneurial self-efficacy mediates the relationship between opportunity recognition belief and new product/service meaningfulness.***

In order to investigate the combined effects of ORB(s) and entrepreneurial self-efficacy more fully, we should also consider the theoretical role of potential moderator/interaction variables, i.e. as part of a *moderated-mediation* modelling approach. From a social cognitive

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<sup>4</sup> This is caveated against social cognitive '*reciprocal causation*' arguments made later in the article. In other words, perceptual ORB(s) unfold/change as time passes. For example, sensitivity to 'good' or 'bad' market news may positively or negatively affect rolling ORB(s) and levels of ESE (especially during the early stages of product/service development).

perspective, we are specifically interested in moderators that might help to explain entrepreneurial decision-making, as exemplars of enactive mastery skills in action (Bandura, 2001; 2012). Key ideas are theorized in the next subsection.

### **Enactive mastery skills – *the role of ‘real options’ as decision-making moderators***

From social cognitive theory, we know that increased general self-efficacy (and ESE) is a reciprocally causative phenomenon. In other words, individuals can develop *enactive mastery* skills based on repeated task successes, as well as acting vicariously through observation and engagement in social learning environments (Bandura 2001, 2002). If individuals develop mastery through current, or past social learning experiences, then they are likely to exhibit higher levels of self-efficacy when taking part in similar future events or situations (Bandura 2001, 2002; Forbes 2005).

Mastery from an ORB and entrepreneurial self-efficacy perspective in the proposed model (see Figure 1) involves investigating YE entrepreneurial awareness and decision-making capabilities. If young entrepreneurs are to learn how to develop effective ORB(s) and higher entrepreneurial self-efficacy, then, being able to consider innovative strategic decision-making options as the new product/service opportunity development process unfolds becomes essential (Dimov 2007). The idea of exercising innovative behavioral strategy options, as part of new product/service opportunity development, is based upon *real options* thinking and associated theories (Hult, Craighead, and Ketchen 2010; Fichman, Keil, and Tiwana 2005; McGrath 1999; Tiwana, Wang, Keil, and Ahluwalia 2007).

Whilst financial options refer to the consideration, or purchase of new contractual assets, real options refer to consideration of strategies (without obligation) for the development of new investment opportunities in order to maximize gains, or limit losses (Doh and Pearce 2004). Real options strategies (e.g. growth, stage, scale, switch, defer, abandon) may be considered singularly, or in multiples or bundles. These can be used for creating, or extracting maximum value through, for example, the sequencing of investments, timing of product launches, entering new markets, revitalizing of existing opportunities, or allowing the deferral of irreversible

investments associated with uncertain opportunities (Basu and Wadhwa 2013; Tiwana *et al.* 2007). Real options strategies should be considered as interaction mechanisms, or support levers for strategic decision-makers working with complex adaptive systems, or entrepreneurial situations that involve high risk, or uncertainty (Basu and Wadhwa 2013; Hult *et al.* 2010; Kogut and Kulatilaka 2001).

A key issue for (YE) entrepreneurial decision-makers is to consider what *must be done*, versus *might be done*, in order to develop and manage new product/service investment opportunities effectively (Fichman *et al.* 2005). When applying Fichman *et al.*'s. (2005) ideas, YE nascent entrepreneurs *must* develop certain new baseline product/service opportunity strategies in order to operate. However, entrepreneurs should also have discretion in the way they choose to enact or exploit new opportunities, often with a view to remaining as flexible as possible. In some cases, entrepreneurs *may* opt to rescale major investments, even the venture itself as part of the opportunity development process, which we refer to as *option 1- venture scalability*; or, they may decide to switch key assets, i.e. change, or innovate the fundamental product/ service application from its initial market destination or use, and redeploy to another. For the model (Figure 1), we termed this switching assets capability as *option 2 - product/service adaptability*. Consideration of real options strategies (e.g. growth, scale, switch use etc.), enables the development of enactive mastery skills and entrepreneurial competences over time<sup>5</sup>. **New venture entrepreneurs learn how to develop and work with linked investment opportunities; thereby, creating a portfolio of new company knowledge and social learning resources** (Basu and Wadhwa, 2013).

Moderated-mediation hypotheses for (option 1) venture scalability and (option 2) product adaptability are thus developed as follows, with moderator interaction effects occurring during the first stage of mediation (i.e. ORB→ESE path):

***H5. Venture scalability moderates the relationship between opportunity recognition belief and entrepreneurial self-efficacy.***

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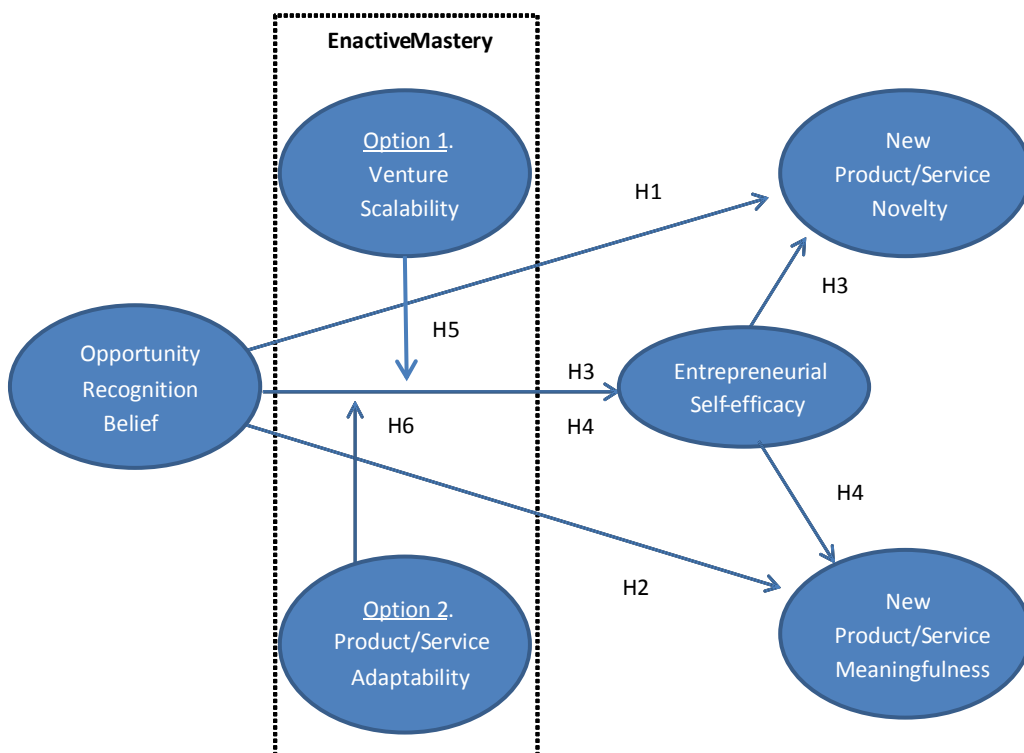
<sup>5</sup> In addition (re: reciprocal causation), entrepreneurial competence enhances capability for enacting real options strategies, while exercising those strategies improves entrepreneurial competences.

***H6. Product/service adaptability moderates the relationship between opportunity recognition belief and entrepreneurial self-efficacy.***

Moderator interaction and conditional indirect effects pertaining to H5 and H6 will be presented and discussed later. It must be stressed, the development of enactive mastery skills is also envisaged throughout the YE new product/service opportunity development process (i.e. not just H5 and H6). However, the latter hypotheses are particularly useful for focalizing key issues in relation to YE decision-making and entrepreneurial action.

In summary, all of the above hypothesized relationships are conceptualized in Figure 1. Results pertaining to H1-H6 are presented and discussed later in the article.

**Figure 1. New product/service opportunity development (conceptual model)**



## **PROCEDURE**

### **Data collection**

YE (Europe) mini-enterprise teams consist of students as young entrepreneurs who are self-organizing, and responsible for the development, implementation and continual review of their new venture activities (Johansen 2010). YE mini-enterprises are student led business start-ups, (see descriptive statistics), and represent a useful opportunity to study product/service opportunity development and entrepreneurial learning in action. A major national survey of Young Enterprise (YE) enterprise team members from the Applied Sciences Universities and Vocational Education and Training (VET) colleges was conducted in the Netherlands. Researchers surveyed 820 team members after the first several months of their YE mini-enterprise start-ups.

To assess the possibility of non-response bias, we tested for statistically significant differences between early and late respondents, on the assumption that the latter should be similar to the former (Armstrong and Overton 1977). Time-to-response was found not to be significant, which suggests that differences between respondents and non-respondents are negligible. In addition, all of the survey measures were refined in collaboration with experienced YE coordinators, and subject to initial pilot testing, thus helping to ensure reliability, validity and a high response rate for the main survey.

### **Final sample**

An email study returned 476 survey questionnaires of YE enterprise participants throughout the Netherlands, giving a response rate of approximately 58%. 149 of these cases were removed due to multiple missing values. A *final case set*, i.e.  $n = 327$  cases remained. This remaining sample size (i.e.  $>300$ ) was considered acceptable for CFA, as well as structural (path) analysis.



## Measurement

Independent/mediator, moderator and dependent variable constructs were measured on seven-point multi-item scales (unless otherwise stated). Cronbach's alpha (see Table 1) composite reliability scores, discriminant and convergent validity analysis (see Table 2) are reported as part of the current study.

### *Independent/ mediator variables*

*Opportunity recognition belief (ORB)* items were adapted from Grégoire *et al.* (2010b, p.141). Respondents were asked, on a seven point scale ranging from; '1 = no, certainly not' to '4 = neutral' to '7 = yes, certainly' (see Table 1 for items used). *Entrepreneurial self-efficacy (ESE)* measures were adapted from McGee *et al.* (2009, p.978). Respondents were asked on a seven point scale; *how much confidence do you have in your ability to...* '1 = very little' to '4 = neutral' to '7 = very much', (see items in Table 1).

### *Moderator variables*

(*Option 1*): *Venture scalability* - four measures were adapted from Tiwana *et al.* (2007). On a scale from '1 = totally disagree' to '4 = neutral' to '7 = strongly agree', respondents were asked; *due to the way we organized our venture...* (see Table 1 for all items). (*Option 2*): *Product/service adaptability* - three items were adapted from Tiwana *et al.*'s (2007, p.179) switching use options measure. On a scale from '1 = totally disagree' to '4 = neutral' to '7 = strongly agree', respondents were asked; *'due to the way we developed it, our main product/service could...'* (see Table 1).

### *Dependent variables*

*New product/service novelty (NPSN)* - four measures were adapted from Im and Workman (2004, p.128). On a scale from '1 = very unlikely' to '4 = neutral' to '7 = very likely', respondents were asked; *'in comparison with competitors, our product/ service...'* (see Table 1). *New product/service meaningfulness (NPSM)* - three measures were adapted from Im and Workman (2004, p.128). On a scale from '1 = very unlikely' to '4 = neutral' to '7 = very likely',

respondents were asked '*in comparison with competitors, our product/ service is...*' (see Table 1 for all items).

### ***Control variables***

*Team size* was considered potentially confounding, as team size may influence individual member's perceptions of ESE, NPSN, and NPSM. Natural log transformations for (Ln) team size were applied to overcome potential data skewness issues (Tabachnick and Fidell, 2007). *Gender* was also controlled for similar reasons, measured through the proxy of (%) fraction of females/women on team. Finally, *education level*, (either MBO/college, or HBO/university level) was controlled for, as another potentially confounding variable.

### **Latent factor measurement modelling**

A maximum likelihood CFA analysis was conducted in AMOS to establish plausibility of the measurement model (Hair, Black, Babin and Anderson, 2010). A six factor baseline/default model fit was considered satisfactory (see Table 1), based on the following statistics:  $\chi^2 = 443$ ; CMIN/DF = 1.873; RMSEA = 0.052; GFI = 0.898/ AGFI = 0.871; CFI = 0.952, TLI = 0.944; SRMR = 0.0424. An alternative five factor model was also tested (i.e. combining ORB and ESE) with much weaker fit statistics:  $\chi^2 = 891$ ; CMIN/DF = 3.686; RMSEA = 0.091; GFI = 0.769/ AGFI = 0.713; CFI = 0.850, TLI = 0.829; SRMR = 0.0863. Four and three factor alternatives were tested as well, both exhibiting unacceptable levels of fit.

**Table 1. Confirmatory factor analysis (CFA)**

n = 327 cases	Mean	STDEV	CFA item loadings
<b><u>Entrepreneurial Self Efficacy (ESE)</u> (<math>\alpha = 0.882</math>)</b>			
Get others to identify with and believe in your vision and plans for a new business.	5.26	1.07	.88
Socially network, i.e. make contact with and exchange information with others.	5.13	1.18	.75
Design an effective marketing/advertising campaign for a new product or service.	5.05	1.07	.77
Clearly and concisely explain verbally/in writing my business idea in everyday terms.	5.33	1.09	.82
Brainstorm (come up with) a new idea for a product or service.	5.01	1.27	.67
<b><u>Opportunity Recognition Belief (ORB)</u> (<math>\alpha = 0.835</math>)</b>			
Applying the proposed business solution with individuals/firms in the target market does constitute a feasible opportunity.	5.39	1.01	.78
The target market does have the <i>size and money</i> to make the application of the proposed business solution profitable.	5.45	1.03	.71
Proposed business solution has the capabilities to answer the needs of the market described.	5.37	0.94	.76
There is a “match” between what the proposed business solution does, and what the target market demands.	5.19	0.96	.71
Attractiveness of the proposed business solution provides enough reason to capable entrepreneurs, to attempt to apply it with individuals/firms in the target market.	5.32	1.07	.64
<b><u>New Product/Service Novelty (NPSN)</u> (<math>\alpha = 0.864</math>)</b>			
Our p/s can be considered as revolutionary.	4.15	1.52	.84
Our p/s provides radical differences from industry norms.	4.44	1.57	.80
Our p/s is really <i>out of the ordinary</i> .	4.85	1.45	.83
Our p/s shows an unconventional way of solving problems.	4.55	1.63	.68
<b><u>Product/Service (P/S) Adaptability</u> (<math>\alpha = 0.915</math>)</b>			
Our p/s could easily be given a different destination from the one originally conceived.	3.74	1.65	.94
Our p/s could serve a different function from the one for which it was created.	3.73	1.73	.91
Our p/s could easily be redeployed for another purpose.	3.97	1.67	.80
<b><u>Venture Scalability</u> (<math>\alpha = 0.844</math>)</b>			
Our new venture activities can be easily scaled up or down depending on needs.	4.92	1.23	.80
We can operate it on a larger or smaller scale without problems.	4.71	1.26	.85
Our production can be easily expanded or contracted depending on needs.	4.78	1.19	.68
Would be very easy to contract or expand the resources initially allocated to our new venture.	4.60	1.06	.69
<b><u>New Product/Service (P/S) Meaningfulness (NPSM)</u> (<math>\alpha = 0.871</math>)</b>			
Our p/s is appropriate for customers’ needs and expectations.	5.39	0.98	.92
Our p/s is relevant to customers’ needs and expectations.	5.27	0.99	.88
Our p/s is useful for customers.	5.44	1.09	.73

## Reliability, convergent, discriminant validity and common method variance

Cronbach's alpha scores (Table 1) and composite reliability (CR) scores (Table 2) were above 0.8. In addition, average extracted variance (AVE > 0.5), thus suggesting no issues with convergent validity (Hair *et al.*, 2010). Finally, maximum shared variance (MSV) is less than AVE, and average shared variance (ASV) is less than AVE, thereby indicating satisfactory discriminant validity (see Table 2 below).<sup>6</sup> A common latent factor analysis (with marker variable) was also conducted with 21% common latent variance found. No further action was taken (Podsakoff, MacKenzie, and Podsakoff 2003).

**Table 2. Reliability and validity statistics**

	CR	AVE	MSV	ASV	P/S adapt	ORB	ESE	NPSM	NPSN	Ventu.. scalab
<b>Prod/service (p/s) adaptability</b>	0.917	0.787	0.065	0.016	0.887					
<b>Opp. recognition belief (ORB)</b>	0.839	0.511	0.236	0.165	0.073	0.715				
<b>Ent. self-efficacy (ESE)</b>	0.887	0.613	0.236	0.119	0.072	0.486	0.783			
<b>New prod/service meaningfulness (NPSM)</b>	0.881	0.714	0.227	0.129	-0.007	0.476	0.395	0.845		
<b>New prod/service novelty (NPSN)</b>	0.867	0.622	0.174	0.090	0.056	0.354	0.340	0.417	0.789	
<b>Venture scalability</b>	0.844	0.577	0.233	0.099	0.255	0.483	0.284	0.294	0.177	0.760

Based on the above CFA analysis and validity results, the baseline six factor measurement model (see Table 1) was considered to be the most *plausible* (Hair *et al.* 2010).

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<sup>6</sup> Table 2 was generated, courtesy of Prof. J. Gaskin's website: [http://statwiki.kolobkcreations.com/wiki/Main\\_Page](http://statwiki.kolobkcreations.com/wiki/Main_Page)

## RESULTS

Table 3 highlights various Pearson's two tailed correlations among the modelled AMOS variables. Firstly, ORB is positively correlated with the key variables of interest: ESE ( $r = 0.416$ ,  $p < 0.001$ ); NPSN ( $r = 0.297$ ,  $p < 0.001$ ) and; NPSM ( $r = 0.426$ ,  $p < 0.001$ ). Secondly, (*option 1*) *new venture scalability* exhibits statistically significant correlations with a number of variables: ORB ( $r = 0.406$ ,  $p < 0.001$ ); ESE ( $r = 0.250$ ,  $p < 0.001$ ); NPSN ( $r = 0.156$ ,  $p < 0.01$ ) and; NPSM ( $r = 0.267$ ,  $p < 0.001$ ). Thirdly, correlation results for (*option 2*) *product/ service adaptability* and *new venture scalability* ( $r = 0.243$ ,  $p < 0.001$ ); and ESE ( $r = 0.073$ ,  $p < 0.10$ , n.s.) fell just outside of the 95% confidence limits. Finally, some of the control variables correlations were statistically significant: team size and ESE ( $r = -0.175$ ,  $p < 0.01$ ); % of females on team and student type ( $r = 0.284$ ,  $p < 0.001$ ).

**Table 3. Pearson's correlations**

	(Ln) Team size	Fraction of women in team	Student type	ORB	ESE	Prod/ service adaptab.	Venture scalability	NPSN	NPSM
(Ln) Team size	1								
Fraction of women in team	.083	1							
Student type (MBO/ HBO)	.014	.284***	1						
Opportunity recognition belief	-.064	-.091	-.105	1					
Entrepreneurial self- efficacy	-.175**	-.069	-.055	.416***	1				
Product/ service (p/s) adaptability	-.054	-.008	.009	.068	.073	1			
Venture scalability	-.074	-.048	-.091	.406***	.250***	.243***	1		
New product/service novelty	-.089	.064	-.025	.297***	.300***	.054	.156**	1	
New prod/service meaningfulness	-.036	-.018	-.083	.426***	.365***	-.001	.267***	.384***	1

Notes: \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$

## **Descriptive statistics**

All enterprises were registered student companies. Enterprise team sizes varied (minimum 3 members, maximum 12, mean (avg), 6.65, stdev, 1.569), with 83.3% of teams having between 5-8 members. On average, 37% of team membership was female. Average mean age of respondents was 20 years. 52.6% of students were from the Dutch Universities of Applied Sciences (HBO), and 47.4% (MBO) management oriented VET colleges.

Most respondents (73.8%) were able to sell at least 500 shares in capital stock, a further 16.7% were able to sell 1500 shares in capital stock, with the remaining 9.5% able to sell 2500 capital stock shares or above. 98.5% is the percentage of firms that produced real products or real services (or both, if any such firm existed). Among these, 92.4% produced products, and 7.6% produced services.

85.1% of enterprises sold 1-2 core products/services, with the rest (14.9%) selling more than 2 products/ services. 93.4% of respondents indicated their business plans were officially approved. 49% considered they had direct competitors in their main trading marketplace. 79.2% of respondents registered 1-3 main competitors, with 20.8% registering 3+ direct/main competitors.

## **Analytical strategy**

Standardized direct and indirect pathways were tested as part of a CB-SEM model in AMOS (version 24) using maximum likelihood estimates, i.e. with bias corrected percentiles and bootstrapped results @ 5000 resamples. Table 4 demonstrates support for direct effects (H1 and H2) and partial mediation support for hypotheses (H3 and H4). Partial mediation results (see Table 4) mean that whilst indirect (combined  $a*b$ ) path effects are statistically significant, the direct effects ( $c'$  paths) also remain significant, i.e. when ESE is included as a mediator in the overall model (Baron and Kenny 1986; Frazier, Tix, and Barron 2004). The partial mediation results passed all required tests for mediation (*ibid*), and the indirect effects supporting H3 and H4 were also verified through bootstrapping analysis (see Table 4). **Partial, as opposed to full**

mediation results (in a YE context) mean that increased levels of entrepreneurial self-efficacy (ESE) partly explain increased levels of p/s novelty and meaningfulness. In other words, increased levels of ESE actively helps fledgling YE teams to learn about developing genuinely novel and meaningful product/service solutions. However, the initial strength of ORB remains key to this process. Partial mediation suggests it is ultimately the team member(s) belief in their new p/s opportunity (i.e. ORB) that positively influences both p/s novelty and meaningfulness.

**Table 4. Path modelling results (in AMOS)**

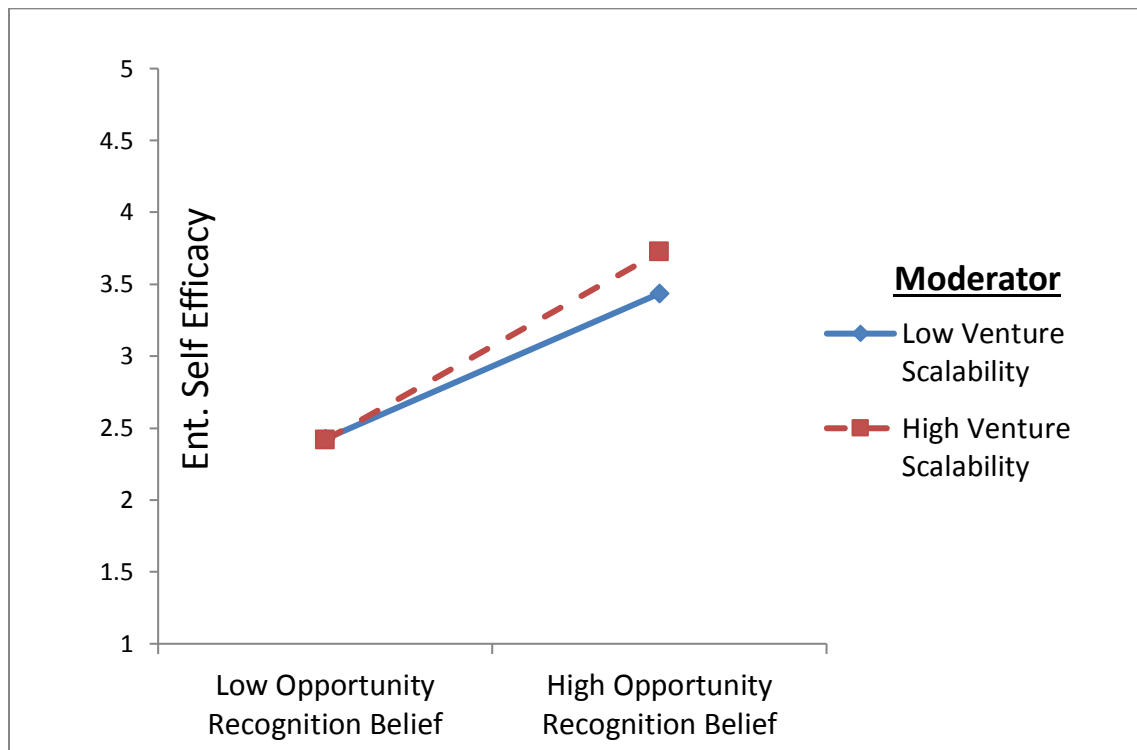
IV->MV->DV Comparative path model relationships	<u>a path</u>	<u>b path</u>	<u>combined a*b path</u>	<u>c path</u> Total effect (without mediator)	<u>c' path</u> Direct effect (with mediator)	Causal steps method	Quantifying indirect effect via Bootstrapping (bias corrected percentile method)	Interpretation
<b>Path 1:</b>  (IV) ORB-> (MV) ESE -> (DV) NPSN	$\beta=0.480$ ( $p=.000$ ) s.e. =0.076	$\beta=0.220$ ( $p=.001$ ) s.e. =0.087	Indirect effect = 0.106	<b>H1 supported</b>  $\beta=0.378$ ( $p=.000$ ) s.e.= 0.098	$\beta=0.266$ ( $p=.000$ ) s.e. =0.110	<b>H3 supported</b>  Partial mediation	Boot =0.105 ( $p=.028$ )  LLCI=0.015 UCLI =0.195	<b>H3 – Indirect effect verified by bootstrapping</b>
<b>Path 2:</b>  (IV) ORB-> (MV) ESE-> (DV) NPSM	$\beta=0.480$ ( $p=.000$ ) s.e. =0.076	$\beta=0.222$ ( $p=.000$ ) s.e. =0.059	Indirect effect = 0.107	<b>H2 supported</b>  $\beta=0.484$ ( $p=.000$ ) s.e.= 0.070	$\beta=0.375$ ( $p=.000$ ) s.e. =0.077	<b>H4 supported</b>  Partial mediation	Boot =0.106 ( $p=.046$ )  LLCI=0.002 UCLI =0.200	<b>H4 – Indirect effect verified by bootstrapping</b>

Moderated-mediation path analyses (Frazier *et al.* 2004) were also conducted (see Figure 1). All relevant variables were standardized and mean-centred before any moderation analysis took place in AMOS. Results demonstrate a significant positive interaction between ORB\* new



venture scalability ( $\beta = 0.136$ , s.e. 0.031,  $p < 0.05$ ) with increased levels of entrepreneurial self-efficacy (ESE). See Figure 2a for the interaction plot. In other words, interaction results show that *venture scalability* strengthened the positive relationship between opportunity recognition belief (ORB) and ESE on stage 1 of the mediated/indirect path model (see Figure 2a).

**Figure 2a. Interaction plot for ORB\* new venture scalability**



Conditional indirect effect results (see Table 5) suggest that being able to scale a YE new venture up or down according to market needs (i.e. at the mean or high value of the moderator) related to a positive new p/s novelty (NPSN) outcome effect. However, a low venture scalability moderator value (-1 STDEV) had no statistically significant effect on NPSN. See the Discussion section for an interpretation of these results in light of theory. There were also no statistically significant conditional indirect effects on new p/s meaningfulness (NPSM) to report. Taking Figure 2a and Table 5 together, it means that if YE teams perceive they have sufficient flexibility to scale their new YE ventures up (or down) as required, it will have a positive effect on their sense of 'can

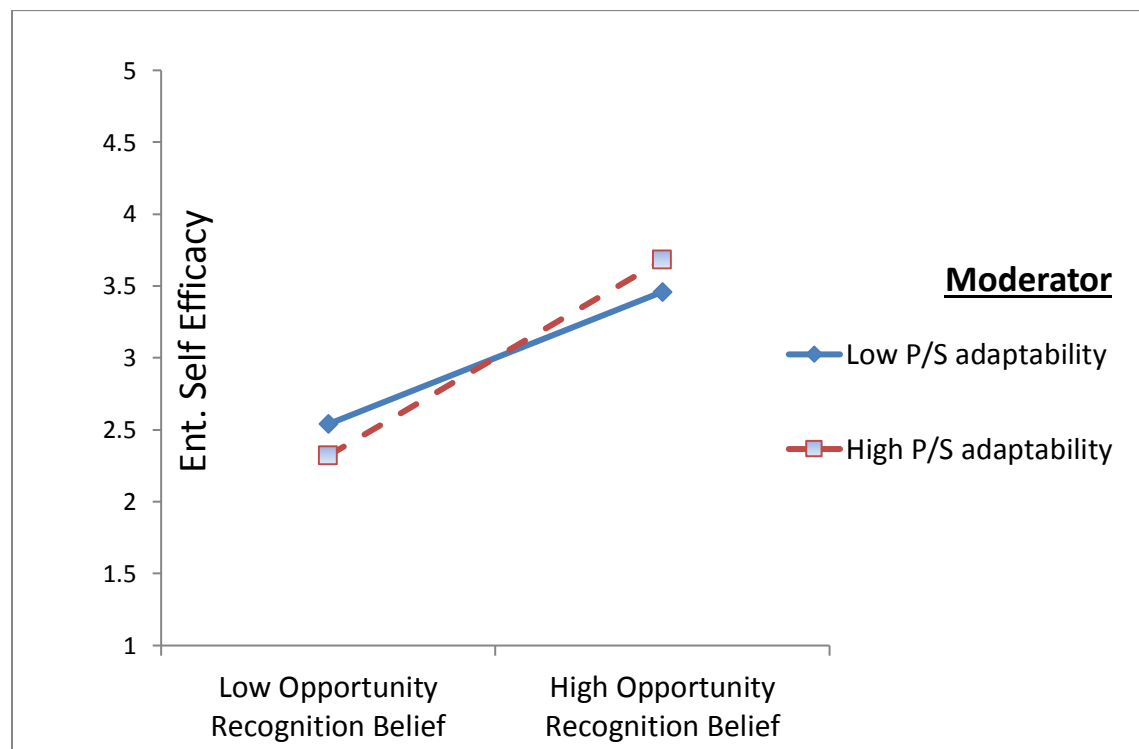
do' and overall ESE. In turn, Table 5 suggests this could also help in new opportunity development situations where novel product/service solutions are required.

**Table 5. Boot effects at different values of the moderator (i.e. venture scalability)**

Indirect effect through ESE	Effect	S.E	LLCI	UCLI	p value
<b>Low indirect effect at NPSN</b>	.140 n.s.	.069	-.005	.276	.060
<b>Mean indirect effect at NPSN</b>	<b>.165*</b>	.083	.001	.336	.049
<b>High indirect effect at NPSN</b>	<b>.190*</b>	.106	.014	.437	.036
<b>Low indirect effect at NPSM</b>	.102 n.s.	.056	-.016	.207	.081
<b>Mean indirect effect at NPSM</b>	.121 n.s.	.068	-.011	.263	.070
<b>High indirect effect at NPSM</b>	.139 n.s.	.085	-.003	.341	.054

Similarly, it can be seen from the Figure 2b interaction plot, that the ORB\* P/S adaptability ( $\beta = 0.147$ , s.e. 0.044,  $p < 0.01$ ) interaction was also related to ESE.

**Figure 2b. Interaction plot for ORB\* P/S adaptability**



Results from Table 6, suggest that the interaction of p/s adaptability on the first stage of the mediated model enabled statistically significant conditional indirect effects on NPSN ( $p < 0.05$ ). In fact, boot effects were significant at all mean-centred values of the moderator, with the highest effect at +1 STDEV from the mean (see Table 6). A low level of p/s adaptability also had a statistically significant effect on p/s meaningfulness (i.e. NPSM). One explanation for this, perhaps, is that *too much* p/s adaptation (i.e. mean or +1 STDEV) might send confusing messages to the target market, i.e. in terms of what constitutes *meaningfulness*.

**Table 6. Boot effects at different values of the moderator (i.e. p/s adaptability)**

Indirect effect through ESE	Effect	S.E	LLCI	ULCI	p value
<b>Low indirect effect at NPSN</b>	<b>.122*</b>	.064	.022	.295	.024
<b>Mean indirect effect at NPSN</b>	<b>.161*</b>	.077	.007	.316	.041
<b>High indirect effect at NPSN</b>	<b>.199*</b>	.106	.017	.442	.031
<b>Low indirect effect at NPSM</b>	<b>.089*</b>	.047	.003	.189	.046
<b>Mean indirect effect at NPSM</b>	<b>.117 n.s.</b>	.063	-.009	.237	.066
<b>High indirect effect at NPSM</b>	<b>.145 n.s.</b>	.088	-.005	.349	.056

In summary, the above interaction effects support the moderated-mediation hypotheses; namely, H5 and H6 on the common stage 1 pathway between ORB and ESE (see Figure 1). Final moderated-mediation (structural) model fit notes were also acceptable: CMIN/DF = 1.817; RMSEA = 0.050; SRMR = 0.0602; CFI = 0.935. The YE contextual and theoretical implications of the above results are discussed more fully in the next section.

## DISCUSSION

Results pertaining to H1 and H2 suggest that ORB(s) positively relate to both product/service creativity variables (i.e. new product/service novelty, and meaningfulness). Reflecting on the new product/service development literature, we know that successful new ventures often rely on balancing two complementary strategic capabilities, namely, *market orientation* and *entrepreneurial orientation* (Atuahene-Gima and Ko 2001; Frishammar and Åke Hörte 2007;

Hong *et al.* 2013; Miles and Arnold 1991). To be market-oriented, requires the action learning ability to continually assess and reassess if new products/services are both novel and meaningful (relative to competitors). Being entrepreneurially oriented, involves being able to innovate quickly, take risks and make strategic decisions in light of fast-paced changing market environments (Frishammar and Åke Hörte 2007; Hong *et al.* 2013).

It is suggested that with some additional future work, adaptations of product/service creativity variables and ORB(s) (Figure 1) could serve as valuable proxies for market orientation. Subjective market orientation proxies would be useful, given recent concerns about entrepreneurial over-optimism and problems with new venture forecasting (Cassar, 2010; Hyytinen, Lahtonen, and Pajarinen 2014). Hmieleski and Baron (2008) make similar remarks, citing the general dangers of hubris (see also Hayward *et al.* 2006), and dispositional optimism leading to complacency and excessive risk taking in dynamic environments. With a market-orientation proxy, young and inexperienced entrepreneurial teams could better self-regulate their internal ORB(s), and learn to re-evaluate against external *checks and balances*, i.e. perceptions of competitor products/services and the marketplace.

H3-H4 results are also useful, as they investigated the indirect effects on both product/service creativity paths, i.e. *path 1* (ORB→ESE→NPSN), and *path 2* (ORB→ESE→NPSM). Partially mediated (indirect) effects (see Table 4) remind us about the importance of entrepreneurial self-efficacy, as a core mediating construct in entrepreneurial studies (Zhao *et al.*, 2005). Indirect path effects (see Table 4) statistically explained some of the total relationship effects between ORB→ and product creativity variables, helping to reinforce some of the points made earlier in previous paragraphs.

More interestingly perhaps, when considering H5 and H6, it is possible to discuss the interaction effects of (real option 1) venture scalability, and (real option 2) product/ service (p/s) adaptability. It is argued that as student entrepreneurs utilise their *real* strategic decision-making options, they increase levels of entrepreneurial self-efficacy, as a natural part of the p/s opportunity development process. These real options are thus, valuable decision support levers, indicative of social cognitive *enactive mastery* skills in action (Bandura 2001, 2002; Forbes 2005). The conditional indirect effects reported in Tables 5 and 6 suggest that both real options 1 and 2 were strongly associated with new product/service novelty. So, for example, being able to

scale a venture up or down quickly, or being highly adaptable with product/service development each contributed to perceptions of p/s novelty in the study (see Table 6 results). Therefore, it can be inferred that both *real options* were valuable *entrepreneurially oriented* decision-levers in the context of this YE study (Frishammar and Åke Hörte 2007; Hong *et al.* 2013).

### **Social cognitive theory contributions**

Firstly, we move the *subjective* ORB entrepreneurial learning discourse beyond the confines of self-regulatory decision-making and single-founder entrepreneurship (e.g. Shepherd *et al.* 2007; Grégoire *et al.* 2010a; 2010b; Grégoire *et al.* 2011). This is achieved by extending a mainly *internal cognitive* ORB research tradition, to include the theorization of student team-based *social cognitive* interactions. Secondly, we extend Grégoire *et al.*'s. (2010b) ideas by capturing elements of innovation and creativity (i.e. new p/s novelty and meaningfulness), as part of a wider product/service opportunity development process. In other words, we demonstrate that social cognitive theory can play a part in modelling and matching team ORB's with potential new product/service ideas (Dimov 2007). Finally, our survey results suggest that social cognitive theory might also help to explain the development of entrepreneurial self-efficacy and the decision-skills of novice YE entrepreneurs. However, further quasi-experimental research would be useful to help develop (and re-test) these initial results, and to re-test hypotheses in different HE action learning settings.

In summary, studying ORB and ESE (combined) has the ability to link the social cognitive learning and skills of nascent entrepreneurs, with their subjective beliefs about the market-oriented feasibility of new product/ service ideas. Further social cognitive research might also help us to investigate some critical entrepreneurial learning questions (as yet, arguably unanswered), for example: *why have some novice entrepreneurs been successful at exploiting new products and services, whilst others less so?* (e.g. Baron 2004; Mitchell *et al.* 2007).

### **So what? – *helping YE policy-makers to evidence entrepreneurial skills***

YE policy-makers would argue that mini-enterprise programmes, such as JA-YE (start-up): “*propels university students forward by growing their self-confidence and business acumen, and empowering them to turn ideas into action.*” (JA Europe 2015, p.18). Policy-makers can also credibly point to entrepreneurial learning programmes that annually engage over 14000 students from 370+ universities. However, from a critical scholarly perspective, it must still be asked: *where is the independent scholarly evidence to support such YE personal development claims?*

We did find some scholarly research, but surprisingly, the empirical/quantitative evidence supporting YE entrepreneurial learning and personal skills development was relatively scant. For example, utilising a cross-sectional YE design of six schools in the UK, Athayde (2009) was one of the first to research personal qualities such as *creativity, personal control, achievement, intuition and leadership*. Based on a combination of forty student observations, as well as (qualitative) focus-groups and interviews with fifteen students in four Norwegian YE companies, Riese (2011) investigated the role of student friendships and personal interactions for the development of *entrepreneurial qualities*. Riese (2013) also reminded us of the need for further quantitative research to examine nascent entrepreneurial attributes such as *creativity, decision-skills and ability to cooperate* during YE start-ups. More recently, Quesel *et al.* (2017, p.11) suggested the success of YE student mini-enterprise companies enabled the “*validation of potential business skills*” among a study of 607 Swiss higher secondary students, but again more research is needed.

Therefore, in terms of a ‘*so what?*’ policy (benefit) contribution, our independent survey results contribute to a small, but growing body of mini-enterprise empirical/quantitative skills research. For example, we are now able to independently evidence (*for the first time*) positive correlative relationships between developing new product/service ORB’s, greater entrepreneurial self-efficacy and the enhancement of entrepreneurial decision-making skills among European YE students.

## Limitations and future research

Firstly, whilst the research context depicts *real* small businesses in action, these new ventures are still organized under the banner of European YE. Therefore, there is a high degree of mentoring, external involvement from universities, government, and other stakeholders, which arguably influences decision-making skills development, entrepreneurial self-efficacy and the new product/service opportunity development process. Secondly, the research model is informed by a cross-sectional analysis of individual YE team members across the Netherlands. This survey-based research design was adopted in order to focus on the early stages of YE product/service opportunity development, and thereby, develop a valuable seminal quantitative study. Thirdly, the data collection and analysis approaches utilized *individual level* team member data, as opposed to (aggregate) *team level* data and composite evaluation scores. This was because we realized that it would be nearly impossible to collect a full and complete perceptual dataset(s) about every participating YE team for this initial study. An implication is that whilst the conceptual model (Figure 1) remains plausible, there still needs to be further work carried out. For example, individual level structured equation modelling (SEM) assumes that all residual effects are fully independent, and there are no clustering effects associated with belonging to particular YE teams, which of course may not be the case. However, as all questionnaires were emailed separately to individual YE team-members, we endeavoured to limit the effect of any group-level perceptual bias beforehand. Additional research was conducted by Furlotti, Podynitsyna, and Mauer (2019) in relation to completely different aspects of YE entrepreneurial performance using multi-level team comparisons, however, a team-level analysis was beyond the scope of this current study. Finally, without some form of YE ability/performance triangulation, self-report measures, including ability-relevant variables such as ORB and ESE may be subject to positive (perceptual) bias, thus affecting the strength of correlations and predictiveness in the overall model.

Future YE research is expected to replicate the current study and expand on the current model (see Figure 1). This will be achieved by adopting mixed-methods data collection for triangulation along with a multi-level unit of analysis approach in different European countries. This is likely to involve repeat surveys, additional focus groups and/or semi-structured

interviews with participants from different countries. This should also help us to examine **social cognitive enabled** enactive mastery (see Bandura, 2002) in action, with commentary from YE students and evaluators alike, albeit, within different national and intercultural contexts.

Finally, with the exception of a few notable articles (e.g. Basu and Wadhwa 2013; Burger-Helmchen 2007; Doh and Pearce 2004; Kogut and Kulatilaka 2001; McGrath 1999; O'Brien *et al.* 2003), options theory appears to be relatively underdeveloped in the behavioral entrepreneurship literature. So, we suggest that further *real options* research for investigating interactions between opportunity development, strategic decision-making capabilities and investment behavior might be rather interesting.

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